

# **The Advanced Technology Microwave Sounder (ATMS): First Year On-Orbit**

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## **Abstract**

The Advanced Technology Microwave Sounder (ATMS) is a new satellite microwave sounding sensor designed to provide operational weather agencies with atmospheric temperature and moisture profile information for global weather forecasting and climate applications. ATMS will continue the microwave sounding capabilities first provided by its predecessors, the Microwave Sounding Unit (MSU) and Advanced Microwave Sounding Unit (AMSU). The first flight unit was launched a year ago in October, 2011 aboard the Suomi-National Polar-Orbiting Partnership (S-NPP) satellite, part of the new Joint Polar-Orbiting Satellite System (JPSS).

Microwave soundings by themselves are the highest-impact input data used by Numerical Weather Prediction models; and ATMS, when combined with the Cross-track Infrared Sounder (CrIS), forms the Cross-track Infrared and Microwave Sounding Suite (CrIMSS). The microwave soundings help meet sounding requirements under cloudy sky conditions and provide key profile information near the surface.

ATMS was designed & built by Aerojet Corporation in Azusa, California, (now Northrop Grumman Electronic Systems). It has 22 channels spanning 23—183 GHz, closely following the channel set of the MSU, AMSU-A1/2, AMSU-B, Microwave Humidity Sounder (MHS), and Humidity Sounder for Brazil (HSB). It continues their cross-track scanning geometry, but for the first time, provides Nyquist sample spacing. All this is accomplished with approximately  $\frac{1}{4}$  the volume,  $\frac{1}{2}$  the mass, and  $\frac{1}{2}$  the power of the three AMSUs. A description will be given of its performance from its first year of operation as determined by post-launch calibration activities. These activities include radiometric calibration using the on-board warm targets and cold space views, and geolocation determination. Example imagery and zooms of specific weather events will be shown.

The second ATMS flight model is currently under construction and planned for launch on the “J1” satellite of the JPSS program in approximately 2016. Additional units are expected on the J2 and J3 satellites, as well as potentially on future European METOP satellites.